IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:	Examiner: Yong Soo CHONG
PORTER	Group Art Unit: 1617
Serial No.: 09/933,316	Confirmation No.: 7064
Filing Date: August 20, 2001	Customer No.: 20855
Title: EMBOLIC COMPOSITIONS WITH NON-CYANOACRYLATE RHEOLOGY MODIFYING AGENTS	

REPLY TO EXAMINER'S ANSWER

Mail Stop Appeal Brief
Commissioner for Patents
Alexandria, VA 22313

Sir:

In accordance with 37 C.F.R. § 41.41, Appellant submits one copy of this Reply Brief in response to the Examiner's Answer. The Examiner's Answer was mailed October 18, 2007, making a Reply Brief due by December 18, 2007. Accordingly, this Reply Brief is timely filed.

STATUS OF THE CLAIMS

Claims 1, 3, 4, 9-11, 15-28 and 38-41 as shown in the Claims Appendix are under appeal.

GROUNDS OF REJECTION

A. Whether claims 1, 3-4, 9-11, 15-28 and 39-41 are unpatentable under 35 U.S.C. § 103 as obvious over WO 00/44287 (hereinafter "Krall") in view of U.S. Patent No. 6,203,779 (hereinafter "Ricci").

B. Whether claims 1, 3-4, 9-11, 15-28 and 38-41 are unpatentable under 35 U.S.C. § 103 as obvious over Krall in view of Ricci and further in view of U.S. Patent No. 4,997,861 (hereinafter "Hechenberger").

ARGUMENTS

A. Claims 1, 3-4, 9-11, 15-28 and 39-41 are not obvious over Krall in view of Ricci

As noted throughout prosecution and in the Appeal Brief, the appealed claims include the following elements: (1) a matrix-forming component comprising alkyl cyanoacrylate monomers, a stabilizer and a plasticizer; (2) a solid aggregate comprising a radiopacifier; and (3) a polymeric **non**-cyanoacrylate rheology modifying agent having a molecular weight greater than 200,000 and selected from the recited group.

The Examiner continues to maintain that "Krall's composition only lacks a polymeric non-cyanoacrylate rheology modifying agent that has an average molecular weight greater than 200,000." (Examiner's Answer, page 4). Ricci was cited for allegedly teaching cellulosic polymers having "an average molecular weight of about 200,000." (Examiner's Answer, page 5, emphasis added). Thus, in response to Appellant's Appeal Brief, it was asserted that (Examiner's Answer, page 6):

> The rejection states that the cellulosic polymers of Ricci have an average molecular weight of about 200,000. (see, Ricci at col 5, lines 1-40; col 6, lines 56-67; col 9, lines 15-24; specially col 5, lines 33-35). Examiner views the language "about 200,000" in Ricci, to also include slightly greater than 200,000. Accordingly, the rejection has already taught all features of the instant claims.

However, for the reasons of record, reiterated herein, Ricci does not suggest all the elements of the pending claims and in fact teaches away from compositions as set forth in the appealed claims.

1. Ricci does not teach or suggest compositions comprising non-cyanoacrylate rheology modifying agents having molecular weights greater than 200,000

Since it is admitted by the Office that there is nothing in the primary reference (Krall) about **non**-cyanoacrylate rheology modifying agents as claimed (let alone rheology modifying agents having molecular weights greater than 200,000), the obviousness rejection is based on the assertion that Ricci teaches or suggests this limitation of all the claims on appeal.

In fact, Ricci fails to teach rheology modifying agents having the molecular weights recited in the claims. The Examiner's repeated assertion that Ricci teaches rheology modifying agents of "about 200,000" is untenable. Ricci does **not** use the term "about" when referring to the upper limit of molecular weight. Of the various passages cited by the Examiner, the only one to set forth ranges of molecular weight is the passage at col. 5 (Ricci, col. 5, lines 23-35, emphasis added):

> Preferred biocompatible polymers include cellulose diacetate and ethylene vinyl alcohol copolymer. Cellulose diacetate polymers are either commercially available or can be prepared by art recognized procedures. In a preferred embodiment, the number average molecular weight, as determined by gel permeation chromatography, of the cellulose diacetate composition is from about 25,000 to about 100,000 more preferably from about 50,000 to about 75,000 and still more preferably from about 58,000 to 64,000. The weight average molecular weight of the cellulose diacetate composition, as determined by gel permeation chromatography, is preferably from **about 50,000 to 200,000** and more preferably from about 100,000 to about 180,000. As is apparent to one skilled in the art, with all other factors being equal, cellulose diacetate polymers having a lower molecular weight will impart a lower viscosity to the composition as compared to higher molecular weight polymers. Accordingly, adjustment of the viscosity of the composition can be readily achieved by mere adjustment of the molecular weight of the polymer composition.

Notably, the term "about" modifies only the molecular weight recitation of "50,000" in the above passage. Accordingly, when read in context, it is apparent that Ricci intended that a molecular weight of 200,000 be the maximum. Had Ricci and the other co-inventors intended otherwise, this phrase would read (as the other range limitations in this passage read) "from about 50,000 to about 200,000" rather than "from about 50,000 to 200,000" as it actually reads. Because Ricci does **not** indicate "about" 200,000, it is clear that a molecular weight of 200,000 is the maximum, upper limit taught or suggested by this reference.

In asserting that Ricci teaches molecular weights of "about" 200,000, the Examiner has improperly construed Ricci's disclosure. When properly read in context Ricci excludes (and actually teaches away) from rheology modifying agents of molecular weights greater than 200,000, as claimed.

2. Ricci does not teach or suggest compositions comprising a solid component

Furthermore, Ricci also teaches away from compositions as claimed that including a solid cyanoacrylate. This reference is unambiguous that the polymers are administered as a fluid-only composition that solidifies *in situ* (Ricci, Abstract; col. 3, lines 36-40, emphasis added):

> Disclosed are methods for treating endoleaks arising from endovascular repair of abdominal aortic aneurysms. The disclosed methods involve the in situ sealing of endoleaks after placement of an endovascular prostheses in the abdominal aorta. Sealing of endoleaks is achieved by injection of either a biocompatible polymer or prepolymer **fluid** composition into the endoleak which composition in situ solidifies to seal the leak. Preferably, the biocompatible **fluid composition** comprises a contrast agent to allow the clinician to visualize the sealing process.
>
> These methods provide for delivery of a **fluid** composition to the sites of endoleaks in the abdominal aorta which **fluid** composition, in situ, forms a coherent solid mass which adheres to the vascular and/or prosthetic cells to seal the endoleak.

Thus, the Examiner's assertion that Ricci "teaches the same polymers as instantly employed" (Examiner's Answer, page 7) is in error. Ricci does **not** teach compositions

as claimed containing a solid cyanoacrylate and, indeed, teaches away from compositions containing such solids.

3. Krall and Ricci do not teach or suggest compositions comprising both cyanoacrylate and non-cyanoacrylate polymers

With regard to the repeated assertion that it would have somehow been obvious to combine cyanoacrylate polymers (Krall) and non-cyanoacrylate polymers (Ricci) in a single composition, Appellant again notes that the record is clear that the claimed compositions, which include both alkyl cyanoacrylate monomers and non-cyanoacrylate polymers, represent a non-obvious improvement over compositions including only one of these polymers (*see, e.g.,* page 3, lines 18-20 and page 25, lines 15-25 of the specification):

> There is no suggestion or recognition [in Krall] that such properties can be improved by a non-cyanoacrylate rheology modifying agent. ...
>
> The composition has the desired viscosity and cohesive characteristics to administer into an ionic fluid environment, such as blood. The composition forms a solid structure upon contact with the ionic environment. ... The composition and method of present invention can be advantageously used to block blood flow to certain tissues, areas, or cavities in the vasculature.

Furthermore, as set acknowledged by the Examiner, Krall does not in any way suggest adding non-cyanoacrylate rheology modifying agents to their cyanoacrylate resins.

Like Krall, Ricci also fails to suggest using non-cyanoacrylate polymers in the same composition as cyanoacrylate polymers. Indeed, Ricci draws a clear distinction between cyanoacrylate prepolymers and non-cyanoacrylate polymers such as cellulose diacetate and unambiguously teaches that they are used separately (Ricci, Abstract and col. 1, lines 11-14, emphasis added):

> Sealing of endoleaks is achieved by injection of **either** a biocompatible polymer **or** prepolymer fluid composition into the endoleak which composition in situ solidifies to seal the leak.

Ricci's teachings that cyanoacrylates and non-cyanoacrylates such as cellulose diacetate are distinct compositions that are to be used in the alternative is also mirrored in the claims of this patent – claim 1 is drawn to a fluid composition generally, claims 2-12 specify that the fluid composition is a biocompatible polymer; while claims 13-14 specify that the fluid composition include a biocompatible prepolymer.

Thus, when considered as a whole for what is actually taught, it is plain that Krall and Ricci do not teach all the elements of the pending claims. The cited references fail to teach compositions as claimed, including the required elements of a (1) a rheology modifying agent of molecular weight greater than 200,000; (2) the presence of solid cyanoacrylates; and (3) combinations of cyanoacrylates and non-cyanoacrylates. Moreover, the references teach away from such multiple-component, solid-containing, rheology modifying agents of molecular weight greater than 200,000 compositions.

4. Modifying Ricci as suggested would destroy the intended function of the reference

The obviousness rejection is also untenable because modifying Ricci as suggested would destroy the intended function of the reference's composition. As set forth by the Supreme Court in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. ___, 127 S. Ct. 1727 (2007) and Patent Office Guidelines regarding determining obviousness, an obviousness rejection is only proper when the proposed combination of elements can be made without changing the function of the structure or method disclosed in the references (see, Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in view of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, Fed. Reg. Vol. 72, No. 195, October 10, 2007):

> The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the

> combination would have yielded nothing more than predictable results to one or ordinary skill in the art at the time of the invention.

Thus, it is axiomatic that an obviousness rejection is improper where the proposed modification would destroy the intended function of the reference (see, e.g. *In re Fritch* 23 USPQ2d 1780, 1783, n.12 (Fed. Cir. 1992) and *In re Ratti* 123 USPQ 349, 352 (CCPA 1979)):

> A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose.
>
> [I]t would require a substantial reconstruction and redesign of the elements shown in [a cited reference] as well as a change in the basic principles under which [that reference's] construction was designed to operate.

In the instant case, using a rheology modifying agent of molecular weight greater than 200,000 would destroy Ricci's clearly stated purpose of using a composition with a molecular weight of 200,000 or under. Moreover, using a composition as claimed that includes solid components (cyanoacrylates) as well as both cyanoacrylates and non-cyanoacrylates in the same composition would destroy Ricci's intended purpose of filling endoleaks using a **fluid**-only, one-component (cyanoacrylate or non-cyanoacrylate) composition.

Simply put, using a one-component, fluid-only composition with a rheology modifying agent of molecular weight more than 200,000 would destroy Ricci's intended function of filling endoleaks with fluid-only, single-component rheology modifying agents of molecular weight no more than 200,000. Thus, there is no combination of Krall and Ricci that renders the pending claims obvious.

For all of the aforementioned reasons, the rejection of claims 33-36 under 35 U.S.C. § 103(a) should be withdrawn.

B. Claims 1, 3-4, 9-11, 15-28 and 38-41 are not obvious over Krall in view of Ricci and further in view Hechenberger

For the reasons of record and as noted above, there is no combination of Krall and Ricci that render any of the claims on appeal obvious. Hechenberger does not cure the deficiencies of the combination of Krall and Ricci. Accordingly, claims 1, 3-4, 9-11, 15-28 and 38-41 are not obvious over Krall in view of Ricci and in further view of Hechenberger.

In sum, a *prima facie* case of obviousness has not been established. Krall and Ricci do **not** teach or suggest all the elements of the claims and Ricci teaches away from using compositions as claimed. Furthermore, modifying Ricci as suggested to alter the molecular weight of the components, to include a solid component and/or to combine cyanoacrylate and non-cyanoacrylates in the same composition would destroy the intended function of Ricci's methods. Accordingly, the rejections under 35 U.S.C. § 103 should be withdrawn.

CONCLUSION

For the reasons stated above, Appellants respectfully submit that the pending claims are non-obvious over the cited references. Accordingly, Appellants request that the rejections of the claims on appeal be reversed, and that the application be remanded to the Examiner so that the appealed claims can proceed to allowance.

Respectfully submitted,

Date: December 18, 2007

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CLAIMS APPENDIX

1. A medical composition comprising

a matrix-forming component comprising alkyl cyanoacrylate monomers, a stabilizer and a plasticizer;

a solid aggregate material comprising a radiopacifier; and

a polymeric non-cyanoacrylate rheology modifying agent that has an average molecular weight greater than 200,000, wherein the cyanoacrylate rheology modifying agent is selected from the group consisting of poly(acrylates), poly(alkenes), poly(alkyl oxides), poly(amides), poly(carbonates), cellulosic polymers and copolymers, poly(dienes), poly(esters), poly(methacrylates), poly(saccharides), poly(siloxanes), poly(styrenes), poly(urethanes), poly(vinyl ethers), poly(vinyl esters), polymers and copolymers having high iodine content, and mixtures thereof.

3. The composition of claim 1, the solid aggregate material further comprising a second non-cyanoacrylate rheology modifying agent comprising an inorganic particulate material.

4. The composition of claim 1, wherein the non-cyanoacrylate rheology modifying agent is soluble in the alkyl cyanoacrylate monomers or in the plasticizer.

9. The composition of claim 1, wherein the non-cyanoacrylate rheology modifying agent and the plasticizer is the same material.

10. The composition of claim 1, wherein the non-cyanoacrylate rheology modifying agent comprises from greater than 0% to about 10%, by weight of the matrix-forming components.

11. The composition of claim 1, wherein the non-cyanoacrylate rheology modifying agent is a polymer comprises from about 1% to about 5%, by weight of the matrix-forming components.

15. The composition of claim 1, wherein the alkyl cyanoacrylate monomer is a compound of the formula $H_2C=C(CN)--C(O)OR$, wherein R is an alkyl group of about 1 to about 18 carbons.

16. The composition of claim 15, wherein the group represented by R is an alkyl group of about 4 to about 10 carbons.

17. The composition of claim 1, wherein the alkyl cyanoacrylate monomer is present in an amount of from about 20% to about 75%, by weight of the matrix-forming component.

18. The composition of claim 1, wherein the alkyl cyanoacrylate monomer is present in an amount of from about 30% to about 70%, by weight of the matrix-forming component.

19. The composition of claim 1, wherein the stabilizer is an inorganic acid, an organic acid, a free radical inhibitor, an antioxidant, or a mixture thereof.

20. The composition of claim 1, wherein the stabilizer is present in an amount of from about 50 ppm to about 500 ppm.

21. The composition of claim 1, wherein the radiopacifier is selected from the group consisting of Ta, TaO, Au, Pt, Zr, ZrO, bismuth subcarbonate, and barium sulfate.

22. The composition of claim 1, wherein the radiopacifier comprises radio-opaque particles with surface-modifying molecules adsorbed to or bonded to the surfaces of said particles for improving the stability of a suspension of said particles within said composition.

23. The composition of claim 1, wherein the radiopacifier is about 25% to about 100%, by volume of the solid-aggregate material.

24. The composition of claim 1, wherein the radiopacifier is about 60% to about 100%, by volume of the solid-aggregate material.

25. The composition of claim 1, wherein the plasticizer is selected from the group consisting of organic esters containing 10 or more carbon atoms and polymeric compounds having a glass transition temperature less than 20°C.

26. The composition of claim 1, wherein the plasticizer is selected from the group consisting of aromatic esters, alkyl esters, phthalate esters, citrate esters, glycerol esters, plant derived oils, animal derived oils, silicone oils, iodinated oils, vitamins A, C, E, and acetates and esters thereof, and mixtures thereof.

27. The composition of claim 1, wherein the plasticizer is about 10% to about 75%, by weight of the matrix-forming component.

28. The composition of claim 1, wherein the plasticizer is about 30% to about 60%, by weight of the matrix-forming component.

38. The composition of claim 3, wherein the inorganic particulate material is selected from the group consisting of fumed silica, silicatious earth, bentonite, and mixtures thereof.

39. The composition of claim 3, wherein the second non-cyanoacrylate rheology modifying agent is a particulate material comprising from greater than 0% to about 75%, by volume of the solid aggregate materials.

40. The composition of claim 3, wherein the second non-cyanoacrylate rheology modifying agent is a particulate material comprising from greater than 0% to about 40%, by volume of the solid aggregate materials.

41. The composition of claim 3, wherein the second non-cyanoacrylate rheology modifying agent is a particulate material comprises inorganic particles with surface-modifying molecules adsorbed to or bonded to the surfaces of said particles for improving the stability of a suspension of said particles within said composition.

EVIDENCE APPENDIX

No documents are submitted in the Evidence Appendix

RELATED PROCEEDINGS APPENDIX

Appellants are not aware of any related appeals or interferences which may be related to, directly affect, be directly affected by, or have any bearing on the Board's decision in the pending appeal. Accordingly, no documents are submitted with this Appendix.